invention shows no improvement over the prior art. The Examiner further indicates that applicant does not provide any information on why using equivalent samples is any different from the methods known in the prior art.

Initially, applicants emphasize that the invention does not "use equivalent samples." Rather, in one aspect, the invention monitors an input byte stream to detect the occurrence of two consecutive identical (equivalent) samples and replaces the second-occurring identical sample with a synchronization symbol. The presence or absence of two consecutive identical (equivalent) samples in the byte stream is determined solely by the information source which generates the input byte stream, such as an A/D converter or other digital processing unit. The operational aspects of such an information source do not comprise any aspect of the present invention.

As discussed in the Background of the Invention section of the present application, prior art systems transmit a sync symbol by inserting the sync symbol into a slot of the transmitted byte stream. This slot which holds the sync symbol would otherwise be occupied by an information byte if the sync symbol were not being transmitted. At the receiving end of these prior art systems, the sync symbol is detected and used to determine byte boundaries and thereby reconstruct the original signal. However, a discontinuity exists at each sync slot position because the information byte removed from the byte stream and replaced by the sync symbol is not remembered, preserved, or otherwise re-inserted into the byte stream at the receiver end. Thus, at each sync slot, there is an information gap.

In the present invention, a sync symbol is similarly inserted into the byte stream before transmission. However, the transmission does not produce a discontinuity because the original byte stream is perfectly reconstructed; namely, with no information gaps. In accordance with the present invention, the sync symbol is uniquely positioned within the byte stream at the transmission end so as to simulate the presence of a byte sample

which is identical (in bit pattern) to the preceding byte sample in the input byte stream. In particular, when there are two consecutive identical byte samples in the input byte stream, the second of the identical samples is replaced by the sync symbol before transmission. If a sync symbol is detected at the receiving end, this indicates that the slot holding the sync symbol initially included an information byte sample which is identical to the sample in the preceding slot. Thus, when a sync symbol is detected by the receiver, it is removed and replaced by the information sample byte from the preceding slot of the received byte stream. Accordingly, the present invention allows sync information to be transmitted while ensuring that there is no information gap at the sync positions upon signal reconstruction at the receiver end.

The invention is shown illustratively in the waveforms of Figs. 2 and 4 for the transmitting and receiving ends, respectively, as explained below.

The original input byte stream is represented by DATA IN, wherein each byte sample resides in a respective slot of the stream. For explanatory purposes, consecutive samples BYT3 and BYT4 are identical, and consecutive samples BYT6 and BYT7 are identical. In accordance with the present invention, the second one (BYT4 and BYT7) of the consecutive identical samples is replaced by a sync symbol SYNC, producing the output waveform SERIAL OUT which is transmitted to the receiver.

At the receiving end, the received byte stream DATA IN (corresponding to SERIAL OUT in Fig. 2) is monitored for the occurrence of sync symbol SYNC. If SYNC is detected, this indicates the presence of two consecutive identical byte samples in the original input byte stream. Accordingly, to recreate the original input byte stream (DATA IN from Fig. 2), the SYNC symbol is removed from its respective slot and replaced with the byte information from the slot preceding the SYNC slot in the byte stream. Thus, the first SYNC is replaced with BYT3 and the second SYNC is replaced with BYT6. As shown by the DATA OUT

waveform (wherein BYT3=BYT4 and BYT6=BYT7), the original input byte stream is recreated.

The advantageous feature exemplified by the DATA OUT stream in Fig. 4 is that no discontinuity exists since each slot of the byte stream provided by the receiver is occupied by an information byte. In prior art schemes, an information gap (e.g., discontinuity) exists at each SYNC position in the DATA OUT stream. In particular, once a byte sample is removed at the transmission end of prior art systems for insertion of the sync symbol, this removed byte is not retained or otherwise "remembered" for re-insertion at the receiving end; thus, there is discontinuity in the byte stream at each sync position when signal reconstruction occurs.

However, in the present invention, the SYNC symbol effectively simulates the presence of an information byte which is identical to the information byte in the preceding slot in the stream. In other words, the SYNC symbol itself indicates that the slot now occupied by the SYNC symbol originally held an information byte identical to the byte sample in the preceding slot of the input byte stream. Thus, the receiver may recreate the original input byte stream by inserting, into the slot holding a SYNC symbol, the information byte from the slot preceding the SYNC symbol slot.

The art neither teaches nor suggests monitoring an input byte stream for the occurrence of two consecutive identical bytes, replacing the second-occurring identical byte with a SYNC symbol in the transmitted byte stream, monitoring the received byte stream for the SYNC symbol, and replacing the SYNC symbol (if detected) with the byte information from the slot which precedes the SYNC symbol in the received byte stream.

In view of the above, applicants believe that the claimed invention possesses improvements over the prior art, and accordingly the specification is enabling. Applicants respectfully request that the objection to the specification be withdrawn.

The Examiner has rejected claims 1-7 under 35 U.S.C. 112, first paragraph, for the reasons set forth in the objection to the specification.

In view of the above discussion regarding the objection to the specification, applicants respectfully request that the rejection of claims 1-7 under 35 U.S.C. 112 be withdrawn.

The Examiner has rejected claims 1-7 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

The Examiner states that claim 1 is rejected as being functional, namely because it is unclear how the claim does the steps that it claims.

The Examiner states that claims 2, 3, and 5-7 are rejected because there is no claimed limitation to support the statements "equivalent" or "immediately preceding."

In response to this rejection, applicants have appropriately amended claims 1-3 and 5-7. Applicants respectfully request that this rejection be withdrawn.

The Examiner has rejected claims 1-4 and 7 under 35 U.S.C.103 as being unpatentable over Bahl et al.

The Examiner indicates that it is known in the art to insert a synchronization bit into a data stream for the purpose of creating a guard signal to protect the data signals. Specifically, the Examiner concludes that the claims are unpatentable because it is obvious to use the synchronization bit as a spacing element to keep the individual bits from becoming too close together.

Assuming, for arguendo purposes, that the Examiner's characterization of the art is correct, applicants nevertheless maintain that Bahl et al. do not teach the present invention as defined by the amended claims.

Bahl et al. neither teach nor suggest a transmission method or system which monitors an input byte stream for detecting the occurrence of two consecutive identical bytes and, if so

detected, replacing the second-occurring one of said two identical bytes with a synchronization symbol. Likewise, Bahl et al. neither teach nor suggest a method or system for receiving the transmitted byte stream which monitors the received byte stream to detect the occurrence of the synchronization symbol and, if so detected, replacing the synchronization symbol with the sample byte which immediately precedes the sync symbol in the received byte stream. The Bahl et al. teaching of inserting sync bits into a byte stream to serve as a spacing element is entirely insufficient to teach or suggest the present invention.

Applicants believe that claims 1-4 and 7 are patentable over Bahl et al., and respectfully request that this rejection be withdrawn.

Applicants acknowledge the Examiner's indication that claims 5-6 would be allowable if rewritten or amended to overcome the rejection under 35 U.S.C. 112 .

Applicants believe that the application is in condition for allowance, and respectfully request that such action be taken.

Respectfully submitted,

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